





In contrast, claims 20-22 have been amended to recite that the fibers of each layer “only extending along an entire length of said ... layer”. The claims have been amended to recite that only full length fibers are included in each layer, which excludes the use of short or chopped fibers. Thus, Jackson does not teach or suggest any of the layers of the present invention and one of ordinary skill in the art would not be motivated to use Jackson’s layers in combination with the remaining references.

#### The Sugiyama Reference

The Examiner states that it would be obvious to combine a first reinforcement layer of Sugiyama in addition to the layers disclosed in Jackson. Applicants respectfully disagree because Sugiyama teaches away from the present invention. Below is a translation of paragraph 0028, relating to table 4 of Sugiyama, as provided from the Japan Patent Office web site ([http://www.ipdl.jpo.go.jp/homepg\\_e.ipdl](http://www.ipdl.jpo.go.jp/homepg_e.ipdl)):

[0028] The grip side (location of a grip edge to 123mm) of the golf club shaft of the above example 1 and the examples 1-2 of a comparison was fixed, 13.5 kgf-cm twisted, the load of the torque was carried out to the tip side, and the twist angle at that time was measured. moreover -- the same -- a grip side (location of a grip edge to 243mm) -- fixing -- a tip side -- weight with a weight of 3kg -- hanging -- every 1kg of after that -- the increase of the weight of weight -- it carried out, and it went and the flexural strength at that time was measured. Those results are shown in a table 4 with shaft weight.

Sugiyama discloses that his shafts range between 78 and 100 grams in weight for only a 2.5° to 2.8° torsion angle. Enclosed herewith is a Declaration from the Inventors submitting test results of the claimed golf club shaft and the results are listed in Exhibit A, Table 1. Table 1 discloses that a 37 gram club of the present invention can withstand a torsion angle of 5.2° to 5.8°. Thus, the present invention can provide twice the torsion angle at half the weight. Thus, it is not obvious to combine

the first reinforcement layer of Sugiyama's heavier and weaker club with Jackson's heavier club to get a lighter and stronger club as claimed.

#### The Kusumoto Reference

The Examiner states that Kusumoto discloses a second reinforcement layer and that it would be obvious to one of ordinary skill in the art to combine Kusumoto's layer with Jackson and Sugiyama. Kusumoto does not disclose the layers in the same orientation and order of the present invention. There is no motivation or suggestion that the particular reinforcement layers of Kusumoto would be obvious to combine with Jackson. Kusumoto's method of combining layers does not approximate the features of the presently claimed invention. Kusumoto discloses AP prepreg, in which the fibers of the prepreg sheet are angled to the longitudinal axis of the golf club shaft, and SP prepreg, where the fibers of the prepreg sheet are parallel to the longitudinal axis of the golf club shaft. *See*, Kusumoto, column 2, lines 38-45. The intermediate sheet is disposed between an AP prepreg layer and the SP prepreg layer. As illustrated in Kusumoto, Figure 2, the intermediate layer is a perpendicular layer (90°) and is sandwiched between an angled layer and a straight layer, or Kusumoto's configuration is "angled, perpendicular, straight" for the section surrounding the "second angled layer".

The second angled layer of the presently claimed invention is located between two straight layers ("SP layers"), resulting in a "straight, angled, straight" configuration. Kusumoto specifically teaches that the intermediate layer is to be sandwiched between the AP prepreg layer and the SP prepreg layer because







Present Invention	First Reinforcement (90°)	First Angled (Θ)		First Straight (0°)	Second Angled (Θ)		Second Straight (0°)	Second Reinforcement (0°)
	First Fiber 90°	Second Fiber +/-Θ	Third Fiber +/-Θ	Fourth Fiber 0°	Fifth Fiber +/-Θ	Sixth Fiber +/-Θ	Seventh Fiber 0°	0°
Cheng - Fig 2	Θ	0°						
Cheng - Ex.*	Θ	Θ	Θ	Θ	Θ	Θ	Θ	0°

\* See, Cheng, column 3, lines 6-12.

Further, although Cheng states that 10-20 layers can be used in a shaft (*see*, Cheng column 3, lines 27-28) Cheng actually teaches away from adding full length layers. Cheng notes that “if the thickness of the entire shaft was increased by 0.02 inches, as opposed to only over the length of the hosel section 24 as in the present invention, the weight of a graphite reinforced shaft would be increased by more than 20 g.” Cheng, column 3, lines 55-60. Thus, one of ordinary skill in the art is not taught or motivated to add a full length reinforcing layer as it would increase the weight of the shaft.

Furthermore, Cheng’s assignee, Harrison Sports, Inc., sells shafts that cover a full range of flexure but does not sell a graphite golf club shaft lighter than 50 grams in weight. *See*, Exhibit B, Harrison Sport’s website ([www.harrison.com](http://www.harrison.com)) the “SL 50 Series”. Accordingly, one of ordinary skill in the art is taught away from lightening Cheng’s golf club shaft below 50 grams. Thus, Cheng does not disclose all the elements the Examiner contends and does not motivate one of ordinary skill in the art to combine the references with the remaining cited art.



The Yoshida Reference

The Examiner states that Yoshida discloses a reinforcement layer inside and adjacent to an angled layer and that is the same construction as Cheng. Applicants agree that Yoshida's first layer is perpendicular to the long axis of the shaft, but there is no teaching in Cheng that an inner layer is needed. Cheng specifically discloses adding outer layers, not inner layers. *See*, Cheng column 3, lines 6-18. Thus, one of ordinary skill in the art is not taught or motivated to add inner layers to Cheng. Additionally, the layering differs from the layering of the present invention.

Further, Yoshida discloses a shaft that is heavier than the claimed invention. Yoshida's shafts, as disclosed in Table 1, range from 40.3-42.1 grams. Thus, the shafts are heavier than the claimed invention and one of ordinary skill in the art is not motivated to add layers to lighten a golf club shaft.

The JP '966 Reference

The Examiner states that it would be obvious to combine the inner layer of JP '966 with the layers in Cheng. As above, Cheng teaches away from adding an inner layer to his layering scheme and JP '966 provides no teaching or motivation to counter Cheng's teaching. Further, JP' 966 is silent on the weight and the strength of the golf club shaft as described. Thus, one of ordinary skill in the art is not taught or motivated to combine layers because he is unaware of the strength benefits and/or weight consequences of JP' 966's layering scheme.





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### Pro 2.5 Titanium

FEATURES

ANIMATION

US  
COMP**Pro 2.5 Titanium: Titanium Reinforced X-6200 Graphite**.335" Tip, 2.5° Torque, Mid-High Flex, 75g, 46", in A/R, R/F, F/S, S/X Flex  
.....(woods only).350" Tip, 2.5° Torque, Mid-High Flex, 75g, 46", in A/R, R/F, F/S Flex  
..... (woods only)

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### Striper J Titanium



FEATURES

ANIMATION

US  
COMP**Striper J Titanium: Titanium Reinforced Satellite Grade Graphite**.335" Tip, 3.8° Torque, MidFlex, 63g, 46", in A/R, R/F, F/S Flex  
.....(woods only).350" Tip, 3.8° Torque, MidFlex, 63g, 46", in A/R, R/F, F/S Flex  
..... (woods only)

### Striper Titanium

FEATURES

ANIMATION

US  
COMP**Striper Titanium: Titanium Reinforced X-4800 Graphite**

.335" and .350" Tip, 3.9° torque, Mid Flex, 75g,

46", in A/R, R/F, F/S Flex (woods only)

## Titanium Lite



**Titanium Lite: Titanium Reinforced Tip, X-5200 Graphite, patent pending  
 .335" and .350" Tip, 3.2° Torque, Mid-Flex, 72g, 46", in A/R, R/F, F/S Flex  
 ..... (woods)  
 .370" Tip, 2.9° Torque, Mid-Flex, 82g, 46", in A/R, R/F, F/S Flex (irons)**

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### Pro 1.4 Low Launch

FEATURES

ANIMATION

A COM



#### Pro 1.4 Low Launch: X-7200 Graphite

.335" Tip, 1.4° Torque, Extra High Flex Point, 70g, 46", in F/S, S/X Flex (woods only)

### Pro 2.5 Low Launch

FEATURES

ANIMATION

US COM



#### Pro 2.5 Low Launch: X-6200 Graphite

.335" Tip, 2.5° Torque, Extra High Flex Point, 72g, 46", in R/F, F/S, S/X Flex (woods only)

### Classic Lite Low Launch

FEATURES

ANIMATION

A COM



#### Classic Lite Low Launch: High Modulus Graphite

.335" Tip, 3.9° Torque, Extra High Flex Point, 70g, 46", in A/R, R/F, F/S Flex (woods only)

### Classic Lite Mid Launch

ANIMATION

A COM

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**Classic Lite Mid Launch: High Modulus Graphite**

**.335" Tip, 3.9 ° Torque, Mid Flex Point, 70g, 46", in A/R, R/F, F/S Flex (wo**

**.370" Tip, 3.9 ° Torque, Mid Flex Point, 75g, 40", in A/R, R/F, F/S Flex (iron**

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### Pro 1.8

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COMMENTS](#)

**Pro 1.8: Boron Reinforced X-6200 Graphite (Boron Certified)**  
**.335" Tip, 1.8° Torque, High Flex Point, 95g, 46<sup>2</sup>, in R/F, F/S, S/X Flex (woods only)**

### Pro 2.5

[ANIMATION](#)[ADD  
COMMENT](#)

**Pro 2.5: Boron Reinforced X-5200 Graphite (Boron Certified)**  
**.335" Tip, 2.5° Torque, Mid-High Flex Point, 95g, 46<sup>2</sup>, in R/F, F/S, S/X Flex (woods only)**

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### Pro 1.8

**ANIMATION****USER  
COMMENTS**

**Pro 1.8 Tour: Boron Reinforced X-6200 Graphite (Boron Certified)**  
.335" tip, 1.8° Torque, High Flex Point, 85g, 46", in F/S, S/X flex (woods only)

### Pro 2.5

**ANIMATION****USER  
COMMENTS**

**Pro 2.5 Tour: Boron Reinforced X-6200 Graphite (Boron Certified)**  
.335" tip, 2.5° Torque, Mid-High Flex Point, 80g, 46", in R/F, F/S, S/X flex (woods only)

### Pro 3.5

**ADD  
COMMENT**

**Pro 3.5 Tour: Boron Reinforced X-5200 Graphite (Boron Certified)**  
.335" tip, 3.5° Torque, Mid Flex Point, 80g, 46", in R/F, F/S flex (woods only)

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 .370" Tip, 2.7° Torque, Mid Flex Point, 69g, 40", in R/F, F/S Flex (irons)

### Pro 3.5



**Pro 3.5 UL 70: Boron Reinforced X-5200 Graphite (Boron Certified)**  
 .335" Tip, 3.5° Torque, Mid-Low Flex Point, 70g, 46", in A/R, R/F, F/S Flex (woods)  
 .370" Tip, 3.2° Torque, Mid-Low Flex Point, 69g, 40", in R/F, F/S Flex (irons)

### Pro 4.5





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**.335" Tip, 4.5° T rque, Low Flex P int, 70g, 46", in L/A, A/R, R/F Flex (wo**  
**.370" Tip, 3.8° Torque, Low Flex Point, 69g, 40", in L/A, A/R, R/F Flex (iron**

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**Pro 2.5 FL 60: Boron Reinforced X-6200 Graphite (Boron Certified)**  
.335" tip, 2.6° Torque, Mid Flex Point, 63g, 46", in A/R, R/F, F/S flex (wood only)

### Pro 3.5



**Pro 3.5 FL 60: Boron Reinforced X-5200 Graphite (Boron Certified)**  
.335" tip, 3.5° Torque, Mid-Low Flex Point, 60g, 46", in A/R, R/F, F/S flex (woods)  
.350", .370", .398" Tip, 3.5° Torque, Mid-Low Flex Point, 65g, 46", in A/R, I F/S flex (woods)  
.370" tip, 3.2° Torque, Mid-Low Flex Point, 64g, 40", in A/R, R/F flex (irons)

### Pro 4.5



**Pro 4.5 FL 60: Boron Reinforced X-4800 Graphite (Boron Certified)**  
.335" Tip, 4.5° Torque, Low Flex Point, 60g, 46", in L/A, A/R, R/F, Flex (wc  
.370" Tip, 3.8° Torque, Low Flex Point, 65g, 40", in L/A, A/R, R/F, Flex (iro

### Pro 5.5



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**.335" Tip, 5.5° Torque, Extra-Low Flex Point, 60g, 46", in L/A, A/R, R/F, FL**  
**(woods only)**

## 50 Lite



**50 Lite: Boron Reinforced X-4800 Graphite (Boron Certified)**  
**.335" tip, 4.0° Torque, Mid Flex Point, 60g, 50", in R/F, F/S flex (woods only)**

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The SL50 Series enables the golfer with a controlled, yet relaxed swing to recapture the distance and competitive "bite" in their game. In the 50 gran range, half that of a standard graphite shaft, this series' super lightweight empowers the more methodical golfer to take back their game. It's Boron reinforced, ultra-high modulus material is the most advanced blend available provides the ultimate combination of light weight, strength and torsional stability.

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**Pro 2.5 SL 50: Boron Reinforced X-6200 Graphite (Boron Certified)**  
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### Pro 3.5

**USER  
COMMENTS**

**Pro 3.5 SL 50: Boron Reinforced X-5200 Graphite (Boron Certified)**  
 .335" Tip, 3.6° Torque, Mid-Low Flex Point, 50g, 46", in L/A, A/R, R/F Flex (woods only)

### Pro 5.5

**USER  
COMMENTS**

**Pro 5.5 SL 50: Boron Reinforced X-4300 Graphite (Boron Certified)**  
 .335" Tip, 5.5° Torque, Low Flex Point, 50g, 46", in L/A, A/R, R/F Flex (woods only)

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## Long Drive Series

### Pro 1.4 Low Launch

FEATURES

ANIMATION

USER  
COMMENT

#### Pro 1.4 Low Launch: X-7200 Graphite

.335" tip, 1.4° Torque, Extra High Flex Point, 90g, 52", in S/X, X/2X Flex (woods only)

### Pro 2.5 Ti Tip

FEATURES

ANIMATION

USER  
COMMENT

#### Pro 2.5 Ti Tip: Titanium Reinforced Tip, X-7200 Graphite

.335" tip, 2.5° Torque, High Flex Point, 85g, 52", in S/X, 2X/3X Flex (woods only)

### Pro 2.5 FL Lite Xtra

FEATURES

ANIMATION

ADD  
COMMENT

#### Pro 2.5 FL Lite Xtra: Boron Reinforced X-6200 Graphite (Boron Certified)

.335" tip, 2.5° Torque, High Flex Point, 67g, 48" / 74g, 50", in S/X, X/2X fl (woods only)

### Pro 2.5 Long Drive

FEATURES

ANIMATION

ADD  
COMMENT

#### Pro 2.5 Long Drive: Boron Reinforced X-6200 Graphite (Boron Certified)

.335" tip, 2.5° Torque, High Flex Point, 104g, 50", in S/X, X/2X Flex (wood only)

.335" tip, 2.5° Torque, High Flex Point, 115g, 55", in X/2X Flex (woods only)

.335" tip, 2.5° Torque, High Flex Point, 118g, 61", in 4X Flex (woods only)

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## Championship Series

The championship series fine tunes a highly skilled player's game and translates it into one of optimal performance. Used by Tour Professionals, these shafts are a premium on providing a "true feel" and put shot making back into your hands. Using the latest breakthrough in graphite technology, this design produces the lowest torque and the tightest shot dispersion possible.

### Pro 2.5 Pro Weight™



**Pro 2.5 Pro Weight: X-5200 Graphite.**

.370" Tip, 2.0° Torque, Mid-High Flex Point, 114g, 40" in R/F, F/S Flex (irons only)

### Pro 2.5 Pro Wedge™



**Pro 2.5 Pro Wedge: X-5200 Graphite.**

.370" Tip, 1.7° Torque, Mid-High Flex Point, 113g, 36", in 360 CPM (irons only)

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announcements!

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### Boron Tour



**Boron Tour: Boron Reinforced Super High Modulus Graphite (Boron Certified).**  
.335" Tip, 2.8° Torque, Mid-High Flex Point, 93g, 46", in R/F, F/S, S/X Flex (woods only)

### Tour Star





**T ur Star:** The patent-pending "T tally Matched System" (TMS) synchronizes frequency and torque. The Tour Star provides the ultimate in a precision matched set of high performance shafts. Each shaft is individually designed and tuned to meet the demands of top professionals. U.S. Patent 5,722,899 .370" Tip, 2.8° Torque, Mid-High Flex Point, 90g, 40", in A, R, F, (irons only)

## Pro Star



**Pro Star:** Designed as a set to produce a true frequency and flex profile. An unique blend of weight distribution and kick point make it an excellent shaft for the above average player.

.355" Tip, 3.0° Torque, Mid Flex Point, 95g, 40" in A, R, F Flex (irons only)

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## Performance Series

### Professional



**Professional: Boron Reinforced High Modulus Graphite (Boron Certified)**  
 .335" Tip, 3.3° Torque, Mid-High Flex Point, 96g, 46", in R/F, F/S Flex (wood)  
 .370" Tip, 2.8° Torque, Mid-High Flex Point, 89g, 40", in R/F, F/S Flex (iron)

### Boron Gold



**Boron Gold: Boron Reinforced High Modulus Graphite (Boron Certified)**  
 .335" Tip, 3.8° Torque, Mid Flex Point, 93g, 46", in A/R, R/F, F/S Flex (wood)  
 .370" Tip, 3.0° Torque, Mid Flex Point, 89g, 40", in A/R, R/F, F/S Flex (iron)

### Tour Classic II



**Tour Classic II: Boron Reinforced High Strain & Intermediate Modulus Graphite**  
 .335" Tip, 4.6° Torque, Low Flex Point, 93g, 46", in L/A, A/R, R/F, F/S Flex (woods)  
 .370" Tip, 3.6° Torque, Low Flex Point, 89g, 40", in L/A, A/R, R/F, F/S Flex (irons)

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## Lady Series

### Lady FL Lite



Lady FL Lite: X-4200 Graphite. Engineered for discriminating lady golfers seeking extra distance and a lighter feel. The Lady FL Lite maximizes swing speed and distance without sacrificing consistency.

.335" Tip, 5.3° Torque, Extra-Low Flex, 55g, 45", in L Flex (woods)

.370" Tip, 4.0° Torque, Extra-Low Flex, 55g, 40", in L Flex (irons)

### Lady Classic



Lady Classic: The Lady Graphite Matrix offers increased flexibility and a soft feel while maximizing both playability and distance.

.335" Tip, 5.0° Torque, Extra-Low Flex, 82g, 44", in L Flex (woods)

.370" Tip, 4.0° Torque, Extra-Low Flex, 79g, 39", in L Flex (irons)

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## Value Series

### Star Plus



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**Star Plus: High Strain Carbon Graphite. The mid weight and low flex point d makes the Star Plus an excellent game improvement shaft.**

**.335" Tip, 4.8° Torque, Low Flex Point, 89g, 45", in L/A, A/R, R/F, F/S Flex (woods)**

**.370" Tip, 4.2° Torque, Low Flex Point, 87g, 40", in L/A, A/R, R/F, F/S Flex (irons)**

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## Junior Series

### Shockwave



**Shockwave:** Designed to be the premiere game improvement shaft for your Shockwave incorporates a junior pex for a higher trajectory and an extra kick impact.

**.335" Tip, 8° Torque, Extra-Low Flex, 75g, 39", in Junior Flex (woods)**

**.370" Tip, 7° Torque, Extra-Low Flex, 75g, 36", in Junior Flex (irons)**

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